Abstract Title Page

Title: Between-classroom Differences in Peer Network Features and Students' Perceptions of the Classroom Environment

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Abstract Body

Background / Context:

Classrooms are important contexts for the development of students' social relationships and attitudes about school. Historically, educational psychologists have theorized about structural features of classroom peer networks that may play an important role in student development. Gronlund, (1959), for example, wrote about the importance of teachers preventing "cliques and cleavages" from arising within their classrooms. He and others believed that egalitarian classrooms—those in which social capital is shared among more students as opposed to a few—would be superior to more hierarchically-organized peer ecologies with respect to student outcomes (Lewin, Lippitt, & White, 1939; Sherif, 1956). Similarly, cooperative learning interventions (e.g., “jigsaw” classrooms; Aronson, Blaney, Stephin, Sikes & Snapp, 1978) were motivated by a general concern with promoting social integration and egalitarian, democratic peer relationships. Perhaps surprisingly, however, there is little empirical evidence regarding the association between structural features of peer networks and student perceptions and learning outcomes. We propose that several distinct features of peer networks may be related to students' perceptions of social relationships and orientations toward learning.

First, classroom peer networks can vary in the degree to which they are characterized by richly interconnected positive social ties. Positive social ties are typically operationalized in terms of students' feelings of friendship or liking toward each other. The richness and such ties can be quantified in terms of their density (i.e., the proportion of all possible such ties which exist) and reciprocity (i.e., the.

Second, peer networks can vary in the degree to which they exhibit a strongly hierarchical (vs egalitarian) status structure. Social status includes components of *likeability* and *popularity* that reflect the status ascribed to particular classmates (Cillessen & Mayeux, 2007). Individual children within a classroom differ in social status, but the degree of such differences in status can vary across classrooms.

Third, the behavioral correlates of status within a classroom reflect the degree to which particular behaviors are positively or negatively sanctioned by the peer group. Such "salience norms" (Cialdini, 1991; Henry, 2000) may reveal something about the peer reinforcement contingencies in a classroom that could affect students' social perceptions and achievement-related beliefs. For example, classrooms in which peer status is positively correlated with aggressive-disruptive behavior have students who report less favorable attitudes towards school (Dijkstra, Gest, Lindenberg, & Veenstra, 2010; Henry et al., 2000).

Purpose / Objective / Research Question / Focus of Study:

The objective of this poster is to examine whether differences in the structural features of classroom peer networks (tight-knittedness, hierarchy, salience norms) are associated with differences in how individual students perceive the classroom environment (relational support from teachers and peers) and express achievement-related beliefs (academic striving, school

bonding) that suggest a positive orientation to learning. The long-term goal of this research effort is to test long-standing presumptions about the features of peer networks that are associated with positive student social-cognitions, and then to identify teaching practices that may be causally related to any such peer network features.

Specifically, we hypothesize that:

(1) tight-knit classrooms with richly interconnected positive social ties will have students who report higher levels of perceived relational support;
(2) classrooms with a more pronounced status hierarchy will have students who perceive less relational support;
(3) classrooms with salience norms suggesting peer support for prosocial behavior and disapproval of aggressive behavior will have students who report higher levels of perceived relational support; and
(4) classrooms with salience norms suggesting peer support for achievement will have students who report higher levels of academic striving and school bonding.

Setting:

The study included children and teachers from two research sites: small- to mid-sized cities in Illinois, and rural areas in central Pennsylvania. In Illinois, we collected data from two school districts that serve populations of 70,000 and 35,000. Both districts serve economically and ethnically diverse populations; approximately 44% of students were classified as disadvantaged (qualifying for free or reduced-price lunch), and more than half of students self-identified as an ethnic minority (approximately 43% African American, 8% Asian, 3% Hispanic). In Pennsylvania, data were collected from one school district that serves a population of more than 12,000, with 35% of students classified as economically disadvantaged. Students in this district were ethnically homogenous (>97% European American).

Population / Participants / Subjects:

In the pilot year of the study (Year 1; 2008-2009), 41 classrooms participated, providing a total of 794 students in 1st, 3rd, and 5th grade. Written consent was obtained from the 41 classroom teachers; and parental consent was obtained for 645 students. Written (3rd and 5th graders) or oral (1st –graders) assent was obtained from children before administering surveys. After accounting for dissenting and absent students, a total of 635 students (80% of all possible students) participated in the first or second administration of the survey ($T_{1=}$ 76%, T_2 = 76%). Because one classroom had extremely low participation (N = 6), its students were excluded from analysis. One child did not respond to the measures used in the present study. Therefore, the final sample for the pilot year was 40 classrooms and 628 children (52% male). In the subsequent school year (Year 2; 2009-2010), a similar number of teachers and students in 1st, 3rd, and 5th grade classrooms were recruited from the same schools.

Intervention / Program / Practice:

The independent variables in this study are structural features of classroom peer networks (i.e., the ways that elementary school students naturally organize themselves within peer groups in the

classroom). The three features of peer networks are tight-knittedness, hierarchy and salience norms (as described above).

Research Design:

The current project is a non-experimental, correlational study. The analyses presented below were based on the pilot year of the study, which included two closely spaced assessments that are combined and treated as a cross-sectional design.

Data Collection and Analysis:

In the pilot year (Year 1; 2008-2009), data collection occurred in two assessments spaced approximately 6-8 weeks apart in the late winter and early spring. Student survey data were collected in classrooms by a team of graduate students. Descriptive statistics for Year 1 are provided in Table 1.

[Insert Table 1 about here]

Students nominated peers in their classroom in response to 19 items: traditional indices of friendship, sociometric status (liking, disliking), perceived popularity (popular, cool), prosocial behavior (helps others, cooperates) and aggression; and used 5-point Likert scales to rate relational support, motivation and school bonding.

Tight-knittedness. Classroom peer network tight-knittedness was operationalized in terms of patterns of positive sentiments reflected in peer nominations for friendship, liking most, helping others and cooperating. The density and reciprocity of these positive sentiments (adjusting for number of nominators) formed internally consistent and stable scales (density α=.95; reciprocity α=.91).

Hierarchy. Classroom-level status hierarchy was conceptualized as the uneven versus uneven distribution of status and was quantified by calculating a centralization index (Wasserman & Faust, 1994) for each peer-nomination that could be interpreted as an indicator of status (i.e., nominations received for friendship, liked most, liked least, popular, cool). For each of these peer-nomination items, the centralization index summarizes the degree to which the number of nominations received by individuals in a classroom were evenly distributed (suggesting an egalitarian structure) or unevenly distributed (suggesting a prominent status hierarchy). The index is scaled so that it reaches a minimum of zero when all individuals receive the same number of nominations, and a maximum of one when a single individual receives all of the nominations. Centralization indices for the status-oriented peer items were moderately intercorrelated and so were used to form a single composite indicator of hierarchy (α=.71); this composite was moderately stable (r=.46) and so was averaged across the two waves.

Salience norms. Salience norms were conceptualized as the positive or negative peer sanctions for particular behaviors. They were operationalized as the within-classroom correlations between nominations received for peer-nominated indicators of status (friendship, like most, popular, cool) and nominations received for specific behaviors (academic skills, aggression, prosocial

behavior). The different peer-nominated status items displayed highly similar correlations with peer-nominated academic skills (α=.83) and so were combined into a single index of salience norms for academic skills; this index was highly stable over time (r=.73) and so was combined across time to form single score. Similar levels of internal consistency and stability were observed for salience norms for aggression (α=.86, r = .78) and for prosocial behavior (α=.81, r = .70).

Achievement-related beliefs. Composite scores computed from student ratings provided internally consistent scales that were reliable over the two assessments. Because scores on these scales were highly correlated between waves, scales were averaged across the two assessments. Academic striving was conceptualized as expressions of a desire to achieve and active efforts to achieve (8 items, α=.73; *r*=.53; e.g., I work hard at school). School bonding was conceptualized as more general statements of cognitive and affective commitment to schooling (8 items, α=.87, *r*=.68; e.g., I feel like I really belong at school).

Perceptions of Relational Support. Student ratings also yielded two reliable scales capturing students' perceptions of relational support, with scales averaged across the two assessments. Teacher supportiveness was conceptualized in terms of feelings of closeness and support from classroom teachers (7 items, α=.80, *r*=.69; e.g., My teacher respects me). Classroom supportiveness was conceptualized as perceptions of a supportive classroom community characterized by generally cooperative and prosocial behavior among classmates (5 items, α=.83, *r*=.63; e.g., Kids in my classroom help each other). Because scores on these scales were highly correlated between waves, scales were averaged across the two assessments.

Findings / Results:

Preliminary analyses examined the association between classroom-level indices of the peer network and student-level perceptions of classroom supportiveness and school bond; multiple regression analyses revealed statistically significant relationships within a number of these domains. Status hierarchy was positively associated with students' perceptions of teacher supportiveness and positive affect towards school (B=1.32 and 0.85, SE=.73 and .58, $p<.1$). The greater the hierarchical nature of the peer network in the classroom, the more students reported feeling of positive affect toward school and perceived teacher supportiveness. The salience norm of aggression was negatively associated with perceived teacher supportiveness and classroom supportiveness (B=-.43 and -.27, SE=.09 and .10, $p<.01$). In classrooms that viewed aggression more positively, students were less likely to report feelings of teacher and classroom supportiveness. Classroom networks favoring academic achievement were positively associated with teacher supportiveness (B=.24, SE=.13, $p<.10$). Counterintuitively, a salience norm favoring prosocial behavior was negatively associated with student-reported academic striving and school bond (B=-.23 and -.38, SE=.08 and .13, $p<.01$) but positively associated with perceived teacher supportiveness ($p<.05$). Results are presented in Table 2.

[Insert Table 2 about here]

Planned final analyses will utilize two-level multilevel modeling, with children nested within classrooms, to link classroom-level peer network measures of status centralization to individual-

level student perceptions of teacher and classroom supportiveness, academic striving, and school bond. Each model will control for gender, grade level, class size, and the fixed effects of school; separate models will test the main effects of salience norms, hierarchy, and tightknittedness.

Conclusions:

Preliminary analyses using multiple regression reveal statistically significant associations between peer status hierarchy and perceived teacher supportiveness and feelings of positive affect toward school, and between the salience norms of aggression and prosocial behavior and all four domains of student-reported classroom and school perception. Counter to our expectations, a more hierarchical classroom was positively associated at the trend level with perceived teacher supportiveness and school bond. Also counter to the stated hypothesis, classroom salience norms favoring prosocial behavior were negatively associated with student-reported academic striving and school bonding ($p<.01$). In keeping with our expectations, prosocial behavior was positively associated with perceptions of teacher supportiveness ($p<.05$), and classroom salience norms favoring aggression were negatively associated with perceived teacher and classroom supportiveness ($p<.01$). While these preliminary analyses reveal modest associations, further analyses using multilevel models will address the nested nature of these data and provide a clearer view of the relationship between the classroom peer network and students' perceptions of the classroom.

As our analyses are concurrent, we are limited in our ability to determine the direction of influence between students' perceptions of classroom supportiveness and the overall organization of social hierarchy within the classroom peer network.

In subsequent school years of data collection, three waves of assessments were obtained for each classroom within a single school year. These data, for which the peer network indices are not yet ready, will permit more powerful longitudinal analyses that will provide a clearer test of whether, for example, features of peer networks early in the school year are associated with changes in student perceptions over the course of the year.

Appendices

Appendix A. References

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Appendix B. Tables and Figures

Table 1
Descriptive Statistics for Measures of Classroom Cohesiveness and Student Perceptions of Relational Support and School Bonding

	M	(SD)
Network level (*N*=39)		
Classroom cohesiveness		
Density of positive sentiment	0.34	(.10)
Reciprocity of positive sentiment	0.80	(.17)
Status hierarchy	0.27	(.07)
Individual level (*N*=634)		
Student perceptions		
Academic striving	4.11	(.62)
School bonding	3.64	(.94)
Teacher supportiveness	4.11	(.78)
Classroom supportiveness	3.65	(.86)

Table 2
Multiple Regression Analyses of Classroom-level Indices of Closeness and on Student Perceptions of Classroom

	Academic Striving	School Bonding	Teacher Supportiveness	Classroom Supportiveness
Tightknittedness				
Density	-0.26 (.29)	-0.49 (.44)	0.11 (.37)	0.17 (.40)
Reciprocity	-0.16 (.17)	-0.27 (.27)	-0.29 (.21)	-0.16 (.24)
Hierarchy				
Centralization	-0.36 (.48)	1.32+ (.73)	0.85+ (.58)	-0.08 (.65)
Salience Norms				
Aggression	0.10+ (.08)	0.11 (.11)	-0.43** (.09)	-0.27** (.10)
Prosocial	-0.23** (.08)	-0.38** (.13)	0.19* (.10)	0.02 (.11)
Academic	-0.09 (.11)	-0.14 (.17)	0.24+ (.13)	0.06 (.15)

Note. Standard errors in parentheses. +p<.10 *p<.05 **p<.01